your guide to

earth from space

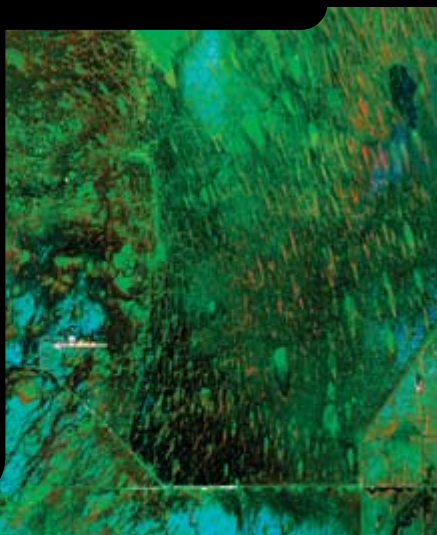
ACTIVITY GUIDE

Smithsonian

What are satellites? Satellites are our eyes in space. They are sophisticated machines that circle the earth in order to provide us with information about weather, geology, ecology, pollution, urban growth, and more. **Do you think satellite imagery is only useful to scientists and military strategists?** Believe it or not, we can all learn something from satellite images.

If you could go anywhere on Earth, where would it be? Satellite images can help you narrow the choices!

First, examine the images in the exhibition, and be sure to read the labels. Try discussing your ideas with a friend. The answers are at the end, but don't cheat. **Exploration is half the fun!**



1. How adventurous are you? Would you like to climb the highest mountain in the world? Where is Mount Everest, and how was it formed?

2. You don't mind rainy days, but some places get so much rain that they're prone to flooding. Can satellite imagery help you avoid some of these wet destinations? Where are they?

3. You've always been fascinated by ancient Egypt. Can a satellite image help you figure out how long it would take to get from metropolitan Cairo to the Great Pyramids? Would you have to bring an overnight bag for the trip?

4. If you travel to Germany, you might make a stop in Hamburg. If you went to the port there, would you see fishing boats, cruise ships, aircraft carriers, or freight container ships? How can you tell?

5. You don't want to be caught in a storm. How could satellite images help you distinguish between regular cloud formations and potentially dangerous weather? What's the easiest way to identify a hurricane?

6. You recently read an article about rainforests and would really love to visit the Amazon basin. Could satellite images tell you if the rainforests there are disappearing? What are the signs?

7. If you wanted to go stargazing or to look for orbiting satellites, would you go somewhere in Europe? Think about whether there might be better places to view the night skies. Are these sites in cities or in the country? Do many people live in these places?

8. How about exploring the nation's capital? If you arrive by train at Union Station (in the northeast corner), where would you go first? The Washington Monument, the United States Capitol, the Jefferson Memorial (the round building near the water), or the White House? Is there a pattern to the way these sites are laid out?

9. Wherever you go, it's important to pack the right things. If you went to Russian Siberia, what should you include in your suitcase? A bathing suit and flip flops? Mittens and a scarf? Wading boots and binoculars? How do you know?

10. You've heard that Southern California has scenic mountains and great hiking. Should you plan a late-summer camping trip there, or are there risks to consider? What are those hazards?

As you can see from studying just a selection of satellite images, remote sensing can actually make the world seem much less remote.

Did you know you can spot these satellites yourself? Watch carefully the next time you're looking at the night sky. That "star" moving slowly and steadily in a path across the sky might be a satellite.

For Discussion:

These satellite images will probably raise some bigger issues in your mind. Think about the negative and positive impacts humans have had on the earth. You might discuss topics such as deforestation, global warming, urban growth, and light pollution.

Answers:

1. Look for *Himalayan Mountains*. The Himalayas, formed by the buckling and folding of Earth's crust, separate India from the rest of Asia.
2. Locate *Rising Floodwaters* and *Recovering from a Storm*. Dongting Lake in China is shown before and after major flooding. In 2005, significant rainfall during Hurricane Katrina contributed to catastrophic flooding in New Orleans and surrounding areas.
3. Find the pictures of *Cairo, Egypt*. Satellite images prove that Cairo is very close to the Great Pyramids. If you're staying in Cairo, you don't need an overnight bag (unless you're camping out in the desert!).
4. Locate *Modern Shipping Technology*. At this German port, you'll see freight container ships. Notice all of the rectangular containers and the train tracks on the right for transporting goods.
5. Spot *Hurricane Alberto* and *Global Weather and Storms*. Satellite images help meteorologists locate and track hurricanes. With winds of 74 miles per hour or greater, hurricanes spin counter-clockwise around a calm "eye." They gather heat and energy as they move over warm ocean waters.
6. Search for *Deforestation in the Amazon*. Many acres have been cut down for logging and agriculture. Red areas show what remains of the rainforests.
7. Find *Earth at Night*. There are fewer great stargazing spots in Europe than there are in places like central Africa or Asia. You can tell by the concentration of lights: Less light means fewer people. See if you can identify some of the big cities in Europe such as Paris, London, or Moscow, and compare them to the Sahara Desert or Greenland.
8. Go to the image of *Washington, D.C.* Did you find Union Station? Look for the train tracks. The U.S. Capitol is the closest landmark (with the blue roof and dome). The four sites are laid out in a "T" shape. The rest of the city was planned as intersecting diagonal avenues superimposed over a grid system.
9. Locate *Lena Delta*. This part of Russian Siberia is wet but very rich in wildlife. Bring your sturdiest boots and some binoculars.
10. Look for *California Forest Fires*. If you go to the mountains here, be sure there's been plenty of rain to lessen the chance of forest fires!

Images courtesy Arizona State University, NASA/ERSDAC; DigitalGlobe; IKONOS satellite image by GeoEye; Jacques Decloitres, MODIS Land Rapid Response Team; NASA/GSFC; National Air and Space Museum; USGS/Eros Data Center.

Earth from Space is organized by the Smithsonian Institution Traveling Exhibition Service in collaboration with the Smithsonian National Air and Space Museum. The exhibition has been made possible by Global Imagination. Additional support has been provided by the U.S. Geological Survey and the Smithsonian Women's Committee.

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